

becker

MINING SOUTH AFRICA

A PART OF THE BECKER MINING SYSTEMS GROUP OF COMPANIES

Mine Automation Technologies



know-how | performance | reliability

Becker – Worldwide

Becker Mining Systems AG Germany (HQ)

Becker Mining America

Varis Mine Technology

Becker Mining South America

Becker Mining RUS

Becker Warkop

USA

Canada

Chile

Russia

Poland

Becker Mining China

Becker Mining Australia

Becker Mining South Africa

Becker Mining Europe

Becker Lasec

China

Australia

South Africa

Germany

Mexico







History

- **1964:** Foundation of the company by Walter Becker
- **1964-1975:** Production of underground transport systems and later on beginning of the production of electrical equipment
- **1975-1985:** Establishment as main supplier of the German coal industry
- **1983-1999:** Internationalization of the company: Start of subsidiaries in South Africa, Poland and China
- **2003-2006:** Subsidiaries in Russia, Australia and Canada
- **2007-2008:** Subsidiaries in the USA and Chile
- **2009-2014** Further acquisitions and foundations in Australia, South Africa, USA, Mexico and Russia

BMSA Company Structure

Becker Mining South Africa (BMSA) is a member of the Becker Mining Systems Group who is a global provider of mine wide solutions and is one of the leading suppliers of underground and surface infrastructure systems within the fields of:

- Energy Distribution  Electrical
- Automation  Electronics
- Communication
- Transportation  Transportation Capital
- Roof Support
- Consumable Equipment  Mechanical



Integrated Infrastructure in the fields of:

Energy Distribution



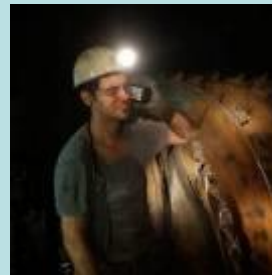
- Transformers
- Conveyor Control Systems
- Switchgear
- Custom Designed Electrical Panels
- Motor Protection Systems
- Flameproof & Non Flameproof Products
- System Installations
- On site Services

Automation



- Mine wide monitoring and control systems
- Belt Rip Systems
- Fiber optic systems
- Telemetry & SCADA
- On site Services

Communication



- Leaky Feeder Systems
- Tagging & Tracking
- Fiber optic networks
- Wi-Fi technology
- Voice over IP
- Surface Proximity Detection
- Underground Proximity Detection
- Environmental Monitoring
- On site Services

Transportation (Capital)



- Man and Material Haulage Systems
- Chairlift Systems
- Mine Winding & Guide Rope Attachments
- Steel Arch Tunnel Support
- On site Services

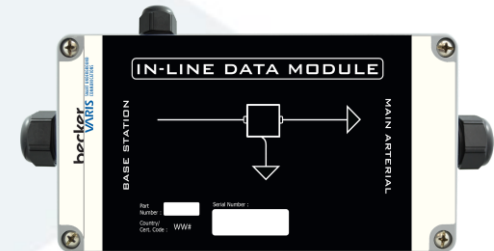
Mechanical (Consumables)



- Lifting Equipment & Accessories
- Hi-Pressure Hydraulic Equipment
- Mine Slurry Pumps

Communication

- Infrastructure for mobile voice and data communication.
- UHF and VHF.
- "Leaky Feeder" coaxial cable receives, transfers and transmits radio signals.
- WLAN additionally available for large volumes of data.
- Analogue and digital system compatible
- Kenwood Integrated Communication Systems & Components
- In-Line Data Modems
- Ethernet Over Leaky Feeder (36Mbs)

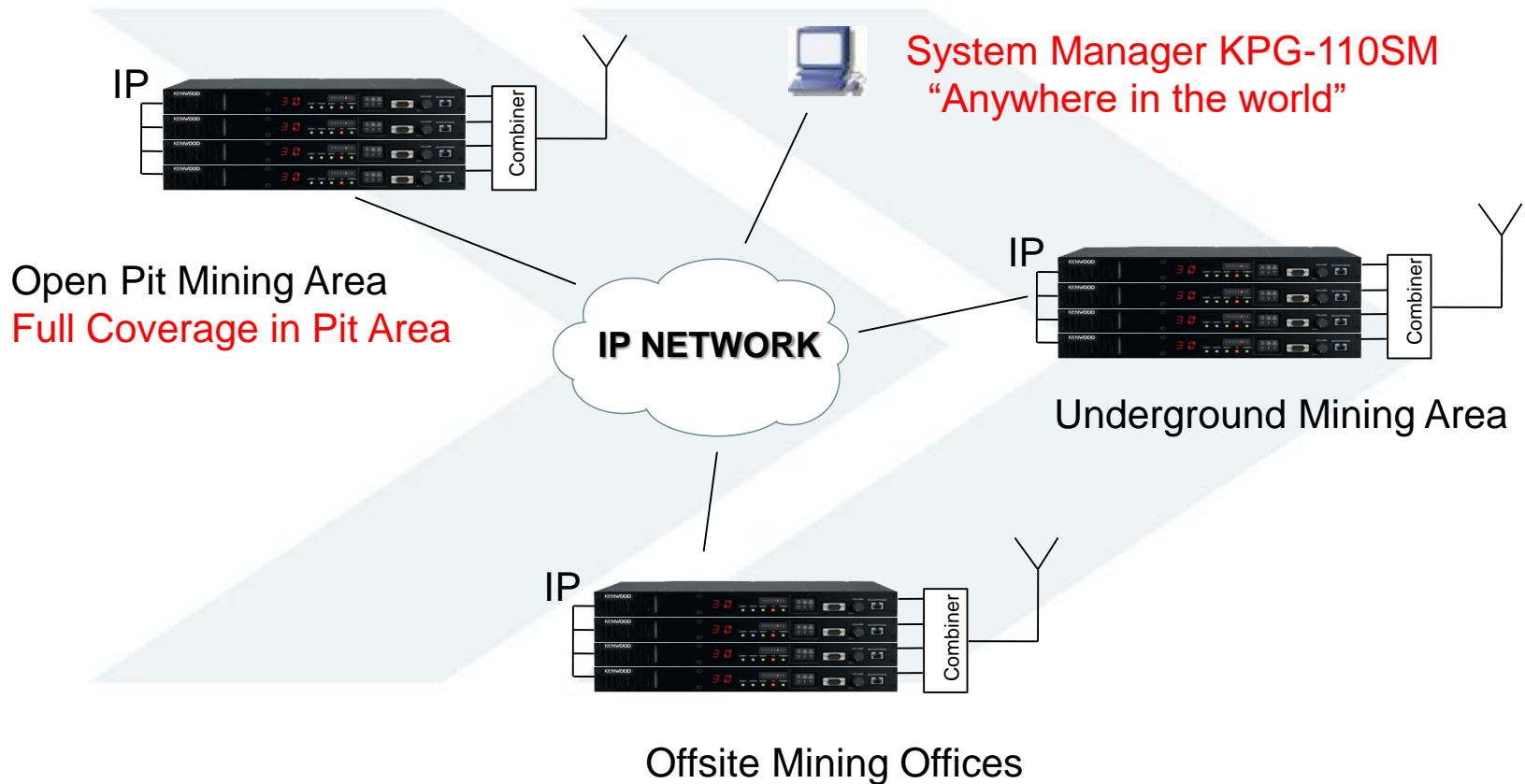


Digital NEXEDGE® NXDN® | Handhelds | Mobiles | Base Stations & Repeaters

becker
MINING SYSTEMS

Multi Site IP Radio Network

Multi Channel - Multi Site – IP Network



Fibre Optic Systems

BMSA systems provide a complete solution for setting up a backbone network using fibre optic technology. The system has a modular design and comprises the following components:

- Fibre optic cables
- Distributors for preassembled fibre optic cables
- Plug connectors for preassembled fibre optic cables
- Device sockets for preassembled fibre optic cables for devices with intrinsic safety
- "i" type of explosion protection
- Fibre optic feedthroughs for connecting housings with "d" type flameproof enclosure type of explosion protection
- Fibre optic feedthrough sockets for preassembled fibre optic cables for devices with "d" type flameproof enclosure type of explosion protection



Wi-Fi Router Access Systems

- 3x Wi-Fi Channels
- 2x tag reader channels
- 3x fiber optic ports
- Integrated serial bus
- Intrinsically safe
- Max. 14 channels (country dependent)
- Up to 300Mbps Data Rates
- Self Healing Capable Back-Haul on Fibre Loss
- Optional Antenna Configurations
- 6 Hotspot "Hops" With ZERO Data Degradation



Tagging and Tracking

Tagging and Tracking for personnel, vehicle and asset tracking. Based on active RFID technology with transponder for precise identification. Includes features such as....

- Vehicle, Beacon, Personnel Tags
- Pseudo Random Transmission
- Unique ID Number
- Battery Status Monitoring
- Multiple Antenna Types
- Multiple Configurations



SmartSense

- Unique 360° Alarm®
- Industry Leading Compact Packaging
- Industry Leading Lowest Power Consumption
- Auto Adjustable Backlight
- Programmable Alarm Set Points
- Calibration Record, Alarm History
- Expandable Up to Four Different Gases in One Compact Monitor with Additional Analogue and Digital Inputs



Hardrock UG Proximity Detection Systems

- PDS detects vehicles, personnel and assets in close proximity
- Electromagnetic, radar, UHF RFID detection
- System self diagnostics ensuring safe operation
- Relay and GPIO vehicle interface
- Operator ergonomic alert options
- On board event logging
- Compatibility to multiple vehicles and lamp manufacturers
- Multiple configurable zoning to minimize impact on mining production and maximize protection of all parties involved
- Patented Tri-Technology System for optimal system scalability and compliance to existing & proposed legislation

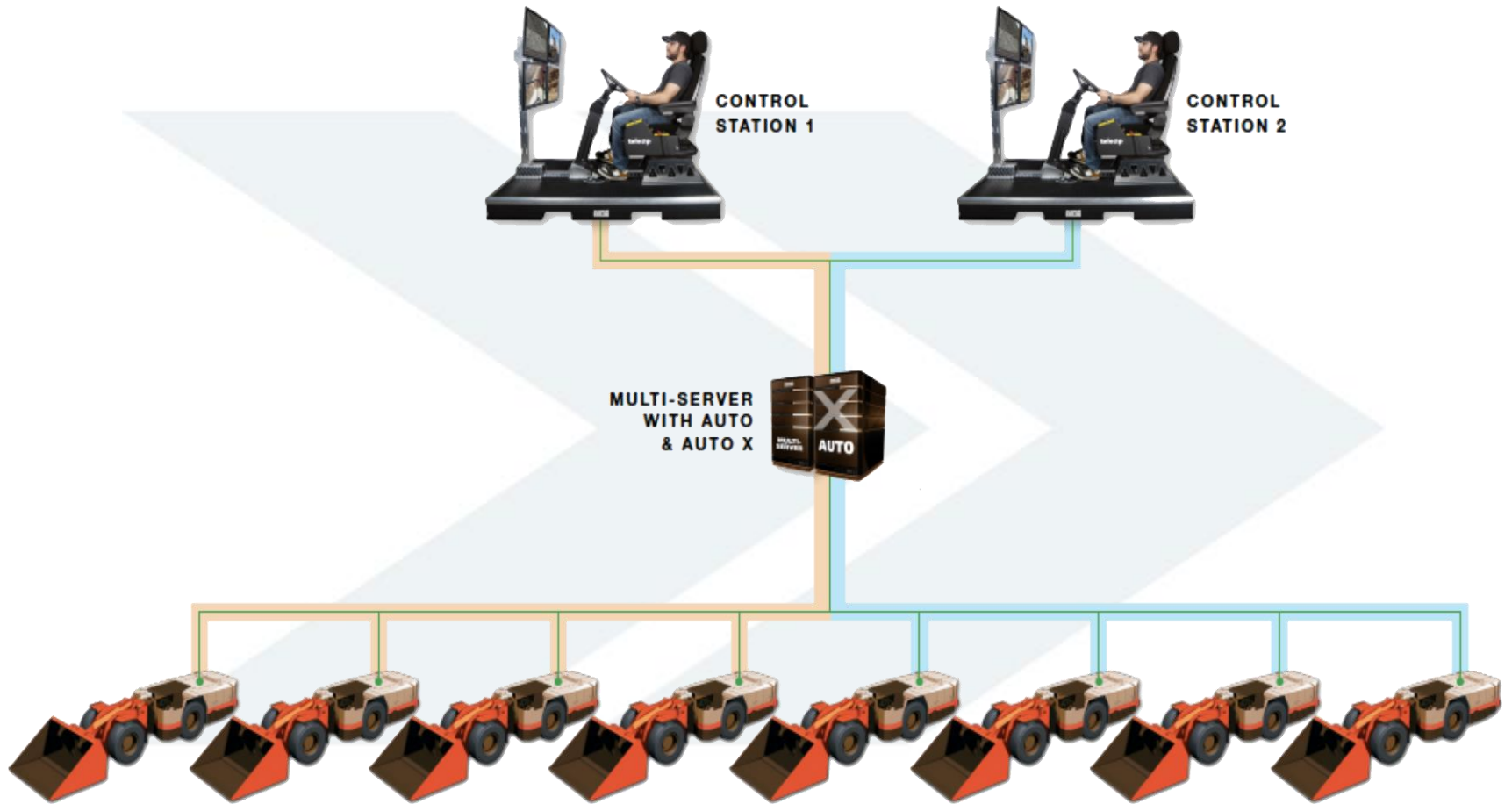


Automation of Machinery

- Operator Safety
- Increased production
- Lower vehicle Maintenance Costs



Multiple Autonomous Machines



Sample Drift Application



Belt Rip Detection Systems

- Colour 12 inch TFT display
- Virtual keypad
- Stainless steel IP65 housing
- 5 Easy access shortcut buttons
- 3 Signal lamps
- Direct real time loop diagnostics
- Remote network access (TCP/IP)
- Password protected



Conveyor Control and Protection Equipment

- BMSA designs an entire turnkey solution for conveyors including the control panel, pull keys, pull wire, pig tails, PLC, VSD and soft starters, belt rip detection, dust suppression, winch controls etc.
- Systems can include communication to SCADA.
- System includes intelligent pull key control siren.
- The control monitoring cards have digital inputs and relay outputs programmable via Ethernet, Profibus and RS485.
- 12V System is I.S. approved for hazardous areas.
- 24V and 48V systems are also available depending on application.



Electrical Equipment

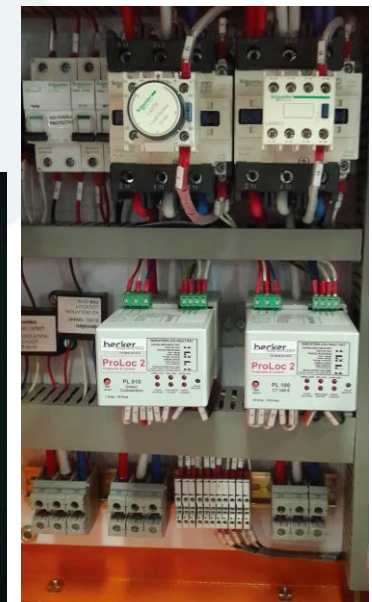
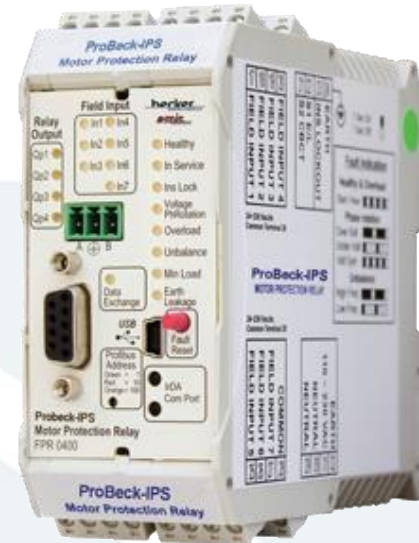
BMSA manufactures the following non-flameproof panels as per Customer specification:

- Distribution panels
- PLC panels
- Motor Control Centres
- Variable Speed Drive panels for 380V, 525V, 690V up to 950kW applications
- Winch panels
- Soft Starter panels: designed for up to 1000V ac application. All soft starters are fitted with a bypass contactor to reduce the heat build up if the thyristors were continuously on line
- Flitting panels
- Direct On line Starter panels
- Pump panels
- Enclosures: manufactured from epoxy powder coated 2.5mm & 5mm steel



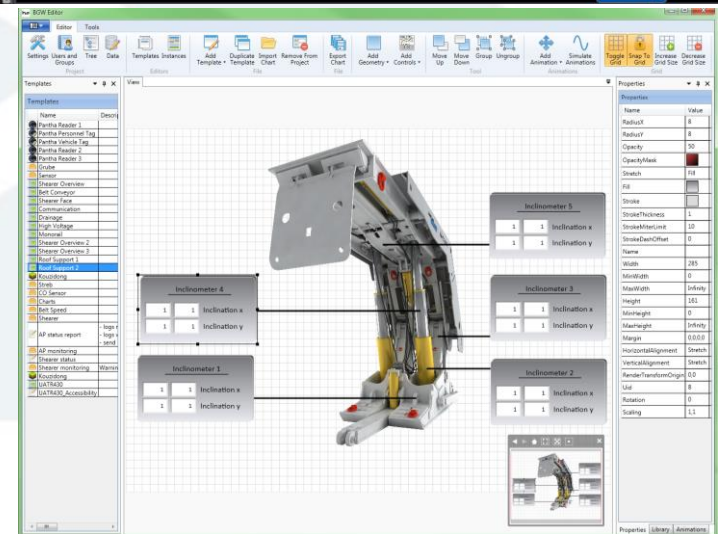
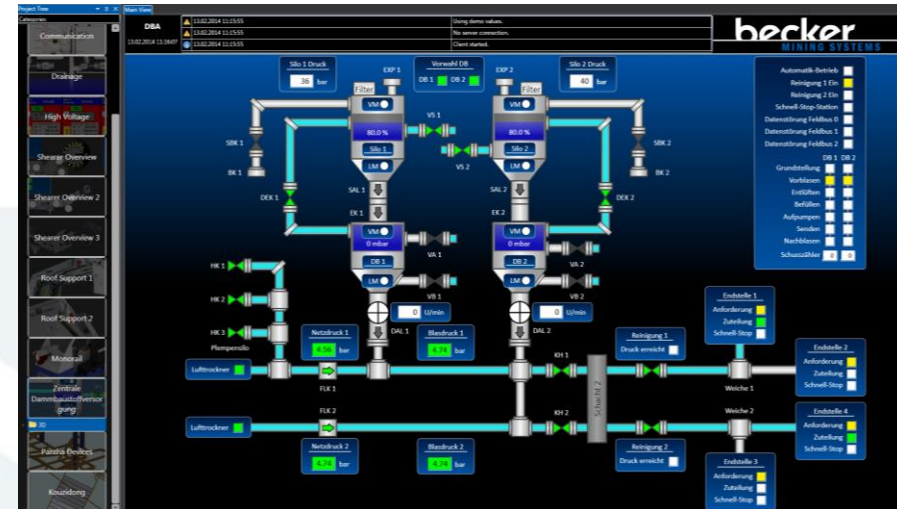
Motor Protection & Cable Theft Equipment

- Stand-Alone Cable Protection System
- SMS Notification
- Motor Protection Integrated
- SCADA Visualization Capable
- Over current (overload) detection
- Unbalanced phase current detection
- Underload (minimum load) detection
- Single phase (phase loss) detection
- Run stall detection
- Starts per hour control
- Vectorial stall detection
- Frozen contact/vacuum loss < 1M Ohm across open contactor or any phase
- Voltage symmetry detection
- High or low frequency detection
- Voltage phase rotation detection
- Insulation failure detection
- Earth fault detection



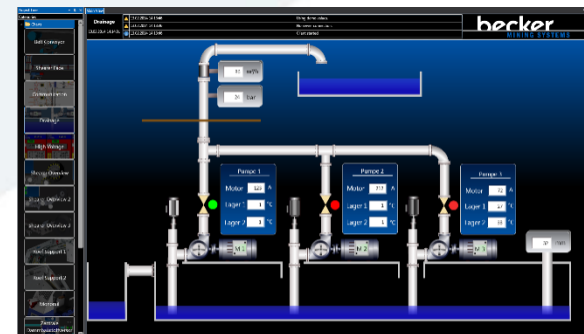
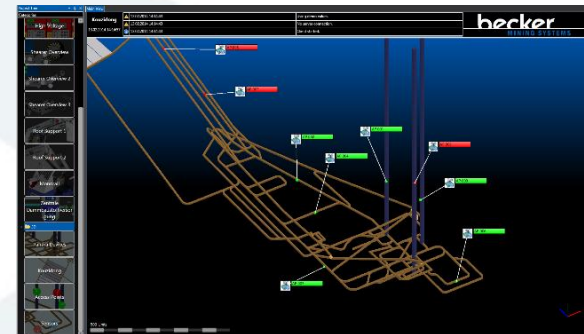
MineView

- 3D Planning- and information systems
- Process visualization and monitoring
- Communication systems for underground mining
- Mobile computing
- Intranet-/Internet technology
- Vector Based Visualization
- Personnel tagging and tracking
- Inventory tracking
- Authentication and administration
- Mine planning
- Centralized system monitoring and control
- Visualization of access points
- Transport/ escape route planning

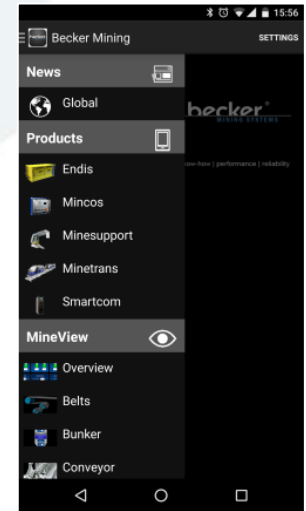
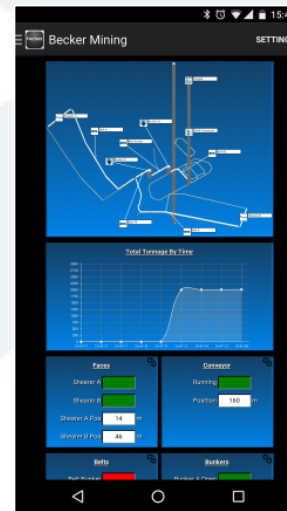
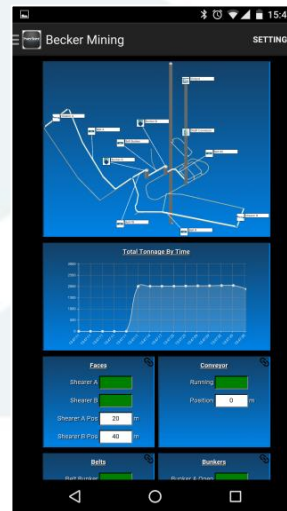
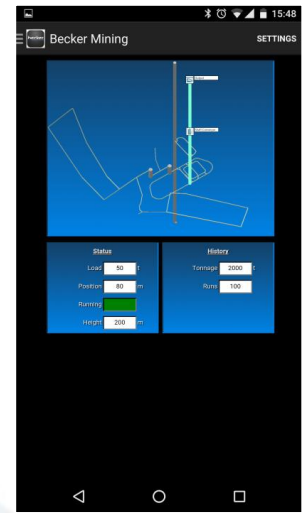
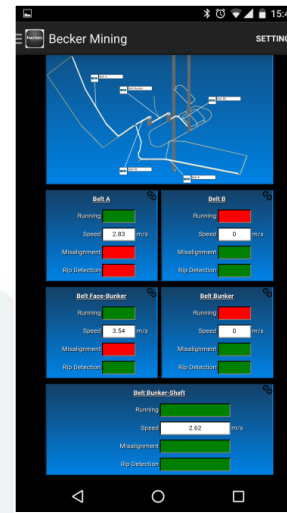
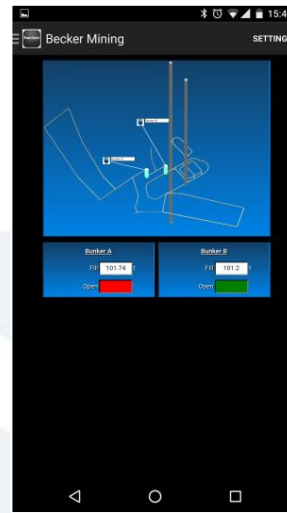
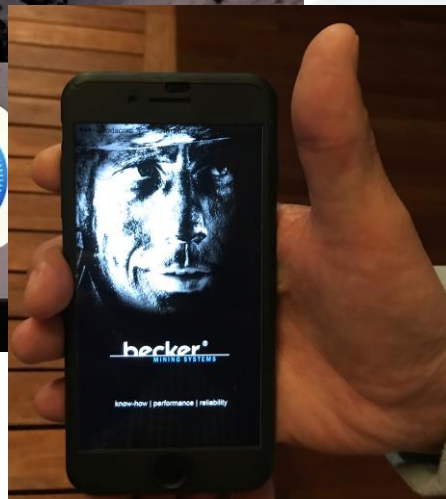
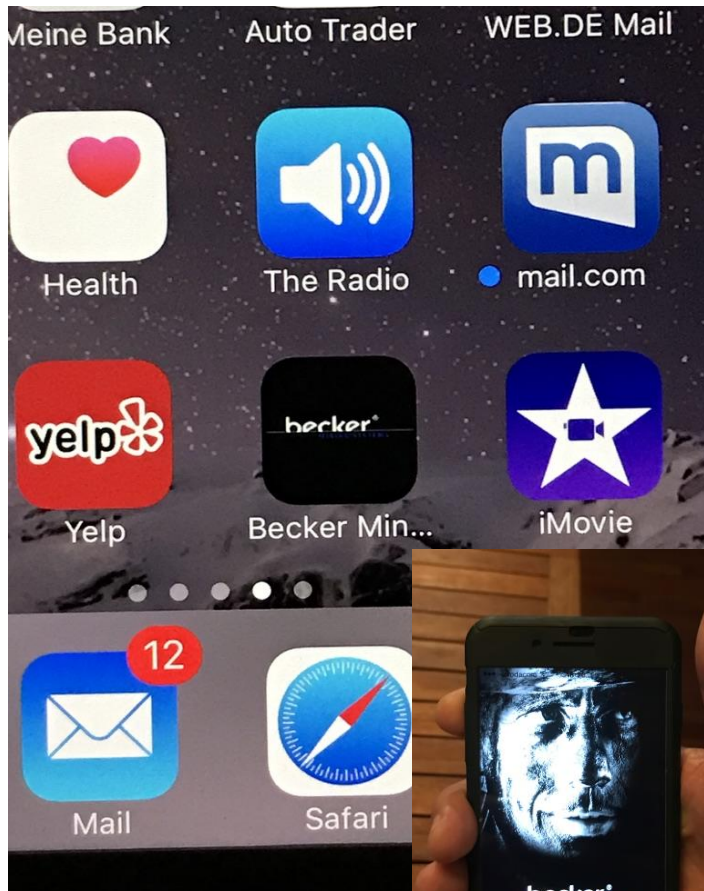


MineView Applications

- Tunneling
- Mine hoists
- Mine ventilation
- Waste water management and freshwater supply
- Energy supply
- Communication systems
- Mine face monitoring
- Handling systems (conveyors)
- Transport of people and materials
- Tagging & Tracking
- Transport / Escape route planning
- Visualization of access points
- Administration of IT components
- Mine planning
- SCADA Integration applications



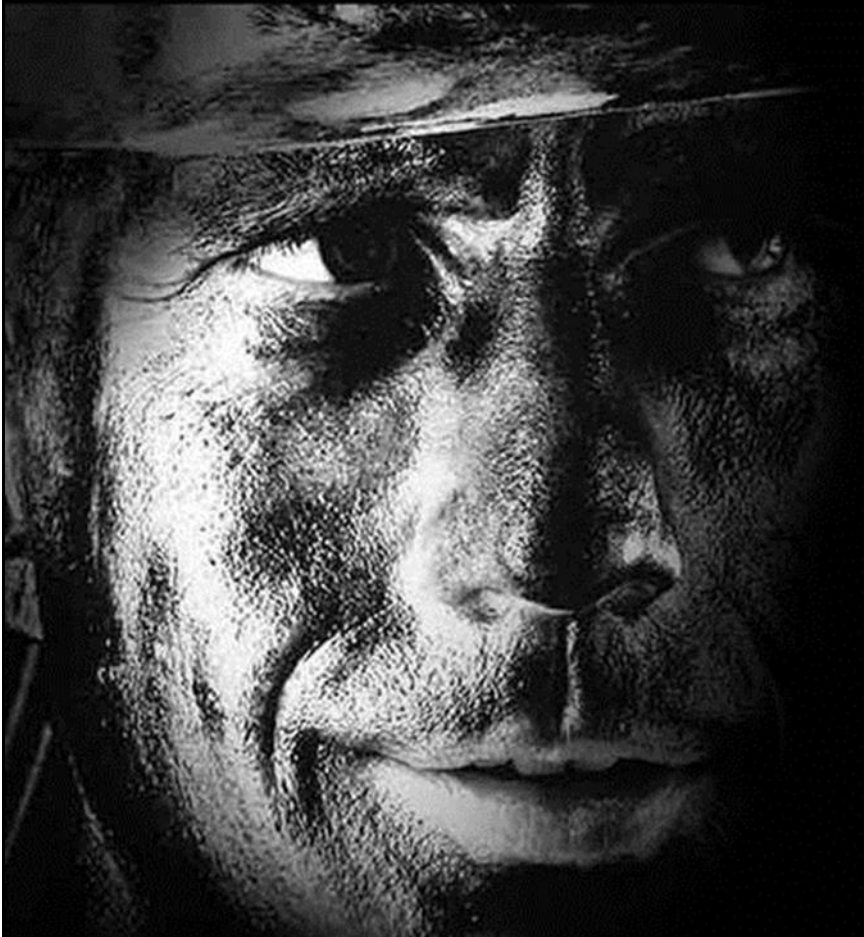
Adroit & IOS App Integration



becker

MINING SOUTH AFRICA

A PART OF THE BECKER MINING SYSTEMS GROUP OF COMPANIES



Thank You
for
Your Attention

know-how | performance | reliability